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STATE COLLEGE AND

STATE DEPARTMENT OF AGRICULTURE AND

U. S. DEPARTMENT OF AGRICULTURE COOPERATING

B. W. KILGORE, DIRECTOR

RALEIGH

arming Under Boll Weevil Conditions

IBUTED IN FURTHERANCE OF THE ACTS OF CONGRESS OF MAY 8 AND JUNE 20, 1914

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.MING UNDER BOLL WEEVIL CONDITIONS

: material in this circular has been brought together by the lists in the Divisions of Entomology, Agronomy, Horticulture, and al Industry, and in a brief way covers the question of farming boll-weevil conditions. More detailed information is either pub-, or will be, or can be had from the workers of these divisions of xperiment Station and Extension Service.

:cial Note for Year 1923. In the region **north** of a line from)ry to Salisbury to Raleigh to Washington, light injury may be ted for 1923. Hence in that region the dust-poison method is not ated for 1923, but the best cultural methods are recommended. hat region will be due for serious injury in 1924.

the region **south** of the line mentioned heavy injury may be ted for 1923, a close approach to the full normal of future years; it o in 1922 in the southern part.

neral Farming Policy for Heavy Infestation. Where heavy injury be expected not more than six to eight acres of cotton should be ed to the plow. Preparation should be made at once for growing food and other crops, so as to make the loss as light as possible.

rming under boll-weevil conditions to best advantage will require unity and county programs, and coöperation of farming, banking, usiness interests. Community and county organizations should be ed where they do not already exist, and immediate action taken in rences to develop and decide on a plan of action which all will v. In most counties there are already organizations which can be for this purpose.

THE COTTON BOLL WEEVIL AND REMEDIES

FRANKLIN SHERMAN

LIFE AND HABITS

e adult weevil is less than one-fourth inch long, brown, and has ll" or "beak" half as long as the body. A female will lay over ggs. Eggs are thrust **inside** the squares or bolls, and hatch to in three to six days. The grub lives inside the same square or boll ich it is hatched, is white with brown head, and lies curled. It es grown in one to two weeks, and is less than one-half inch long. en changes to the pupa. The pupa is white, does not feed, stays in ame square or boll, and changes to weevil in four to eight days. weevil then emerges from the square or boll, lives outside, lays eggs, inally *dies*.

e weevils are not very active, are rather clumsy walkers—can fly, re not inclined to do so except in late season when seeking fresh g squares or seeking hiding-places from cold.

Infested *squares* "flare" and fall to the ground, while infested remain on the plant but do not open properly.

Cotton is the only plant known in this part of the country upon w the insect can live or its offspring mature. The insect does not habitu feed on, or in, any other crop, weed, plant, or tree.

Only adult weevils live through winter. After cotton is dead weevils seek shelter in woods, along fence rows, ditches, around b ings, under trash; in cracks in earth, etc. They then go without until the cotton is up in spring, many dying in the meantime.

The weevils come out irregularly in spring and feed on tender co growth, but there is no egg-laying until squares are formed.

Many other insects are mistaken for boll weevil, but time and ex ence will teach observant persons to know it. It is our only "bill-wee which is badly destructive to squares and bolls, but many other k of weevils are found in cotton fields, or on cotton plants.

From egg to weevil takes two to four weeks, being quicker in summer, and slower in cool weather, averaging perhaps three weeks. expect four or five generations per season to be the normal occurr in North Carolina. These are not clearly separated and from summer to frost we may find eggs, larvae (grubs), pupae and a weevils all in the same field at the same time. The weevils bec increasingly abundant as the season advances, reaching maximum ab ance in September and October; hence late maturing cotton is likel suffer very severely.

HISTORY OF ITS SPREAD

It spread from Mexico into Texas in 1892, reached Louisiana in 1 Mississippi in 1907, Alabama in 1910, Georgia in 1915, South Caro in 1917, and North Carolina in 1919.

It is now (January, 1923) in the entire cotton-growing area of N Carolina. It seems fully able to live in any part of the United St where cotton can be grown as a commercial crop. We have no re to expect our climate or latitude to exempt us.

EXPECTATIONS AS TO DAMAGE

Its ravages are worst in regions of mild winters, abundant rain and where cotton makes rank growth. It is therefore expected tha effects will be more severe in the southeast and eastern parts of State (coastal plain) than in the more hilly piedmont.

The amount of damage varies greatly, ranging from as low as 10 per cent in more elevated, cooler and drier localities in fortu years—to as high as 75 or 90 per cent in lower, warmer, wetter reg in unfortunate years. A mild winter favors the weevils; a severely winter checks them. A rainy summer favors them; a very hot summer checks them.

ll exposure to temperature as cold as 10 degrees above zero is fatal
m, but in nature (in North Carolina at least) few are thus exposed.
do die in winter, but there are always survivors.

CONTROL MEASURES

m time to time various persons (whether with "an axe to grind"
) have put forth, and will yet advance, proposals, ideas and "reme-
which they claim to eradicate the weevil or lessen its ravages.
J. S. Boll Weevil Laboratory at Tallulah, La., experiments with and
s numerous ideas which offer promise. No grower should depend
y idea or "remedy" that is not backed by the approval of either
ficials of the State or the Federal government. Improvements in the
ds will be covered by *official publications*. Do not be misled by
ature or unauthorized propaganda.

KILLING EARLY WEEVILS

early season (May and June) weevils may be found on the youngest
and in the "bud," until squares form. They can be gathered by
but they come out of winter quarters so irregularly that repeated
g is necessary; hence this method is chiefly of use in small fields,
d patches and with cheap labor. If early weevils are abundant a
dust application of calcium arsenate may be given before squares

GATHERING INFESTED SQUARES

fested squares turn pale and usually drop. Some squares are shed
are not infested. The infested squares contain eggs, grubs, or
of the weevil, often more than one in a square. As the squares
asily seen, the gathering and burning of them is somewhat more
ical than the gathering of the weevils, but for the same reason of
ess and cost, this cannot by itself be considered an adequate remedy.
ushed into the middles and fully exposed to hot sun, many develop-
veevils are killed, but burning is more certain. If this method is
used the squares should be gathered every week or ten days at least;
wise the weevils will have matured and escaped from many of them.

DESTROY OVER-WINTERING WEEVILS

rning over ditch-banks, along fence-rows, brier patches, and thickets
to cotton fields, and the clearing up or burning of litter and trash
near cotton fields, kills the weevils or exposes them so that more
uring winter. This whole process is covered by the term, "clean
ing."

LOCATION OF FIELD

If a cotton field is located one-half mile or more from woods reasonably far or free from ditch-banks, weedy growth and other win cover for the weevils, the weevils will not find it so early in the sea or will do so in less numbers.

GETTING RID OF STALKS IN FALL

It has been pointed out that the boll weevil is strictly a cotton ins From the time the cotton plants die in the fall until cotton is up next spring, they are entirely without food, and many die during time from the combined effects of cold, exposure, and starvation. then, we can prolong the length of time that they are without food, will increase the winter death-rate of the weevils.

As early "setting" of the cotton crop is greatly desired in orde partially escape the damage by the enormous broods of weevils in summer and fall, it is *not* advisable to plant late. Our only hop lengthening the period is at the other end of the line, by getting ri the stalks in the fall, as long as possible *before* the time they woul killed by frost. It serves very little, or no purpose, to destroy the st after they are dead. We would suggest chopping down and plow under the stalks, rather than burning them.

In the southeastern and eastern parts of North Carolina where season is longer, there is the possible chance of getting the bulk of crop matured and harvested in time so that the stalks may be, in s seasons at least, plowed under before they are killed by frost. Yet know that this cannot always be done, and in the cooler regions where season is naturally shorter there is little or no chance to use this met

RAPID GROWING CROP

The weevils become enormously abundant in the late summer fall; hence every reasonable effort should be made to secure *the r growth of the crop,* so that when the weevils reach their most destruc abundance there shall be all possible assurance of a crop already bey destruction. See discussion of Cultural Practices on pages 13 and

THE POISONING METHOD

This method is discussed in a separate article by Mr. B. R. Coad the U. S. Bureau of Entomology. It consists in dusting the plants dry calcium arsenate powder. The powder must conform to cer standards as to chemical content and fineness in order to give full ben and it is applied with special cotton-dusting machinery. Give car attention to Mr. Coad's article. (See page 8.)

The poisoning method is now the most promising of all the di means of combating the weevil, but it must be done with care and j

o secure proper results. It is expensive; hence cannot be expected uccessful on very poor land which could hardly pay expenses even e were no weevil. In general, it does not pay on land which has ral productivity of less than one-half bale per acre.

poisoning method is still under study and improvement. The must be alert to secure new bulletins, circulars, or other data may be issued on this subject from time to time by the State or U. S. Department of agriculture.

the benefit of county agents and farmers we list below reliable from whom suitable machines and suitable calcium arsenate, ally made for boll-weevil work, can be obtained. Specify that you erested in control of boll weevil.

Manufacturers of Cotton Dusting Machines

(Write to these firms for catalogues, prices, etc.)

Manufacturing Company, Muncie, Ind., make a "Hand Gun," "Saddle Gun."

nal Manufacturing Company, Des Moines, Iowa, make the "Ideal," mule Machine."

-Love Pump Corporation, Rockford, Ill., make the "Warlo," "One-Machine."

ra Sprayer Company, Middleport, N. Y., make a "Hand Gun," "Cart Machine."

iscussion of Dusting Machinery (pages 8 and 9) for discussion of pes of machines above listed.

Manufacturers of Calcium Arsenate for Dusting Cotton

(Write for prices, size containers, etc.)

elli Chemical Company, Birmingham, Ala.

al Chemical Company, sales office, Ferry and Wabash Tracks, uis, Mo.

s-Piver Co., sales office, 30 Church St., New York City.

vin-Williams Company, 601 Canal Road, N. W., Cleveland, O.

ara Sprayer Company, Middleport, N. Y.

nan Chemical Engineering Company, 136 Liberty St., New York

te Agencies Company, 233-245 West 1st St., Bayonne, N. J.

ia Chemical Company, Milwaukee, Wis.

POISONING COTTON BOLL WEEVILS

By B. R. Coad, *Bureau of Entomology, U. S. Department of Agricul*

As might be expected, innumerable attempts have been made to p the boll weevil. It was found long ago that some weevils cou killed by poisoning, but only in comparatively recent years has a p able method for commercial use been developed. This is the u calcium arsenate applied to the cotton plants in the form of a dry cloud. This method was tested experimentally for a number of years it was developed to the point where it was safe for farmers to atter take advantage of it. During the past three years it has been used rapidly increasing scale by cotton farmers until at the present tim consumption of calcium arsenate for this purpose is probably eight or ten million pounds annually. Results have of course v and have especially emphasized the necessity of following exacti right methods, but on the whole they seem to justify the conclusio the use of this poison will become widely established as a mea reducing the boll-weevil damage.

The first point which must be considered is the fact that poison an expensive operation and must be attempted only under the conditions or no profit can be expected. It will pay to poison on land sufficiently fertile to yield at least one-half bale per acre with injury eliminated, and also only on cotton suffering a fairly s amount of weevil damage. It is impossible to give generalized figures which are locally applicable, but records kept of operati a large number of properties scattered over many states during th season (1921) show the average cost to be from $4 to $6 an acre full season's treatment of fairly heavily infested cotton. The ga be expected from this also vary widely, but usually average on any erty of considerable size between 200 and 400 pounds of seed cott acre. The prices of both cotton and dusting materials fluctuate so that a good rule to follow is not to poison if the cost of the ca arsenate, the cost of the labor to apply it and the depreciation dusting machines, will total more per acre than the current value pounds of seed cotton.

DUSTING MACHINERY

It has been found that satisfactory control can be secured on using specially designed dusting machinery for applying the p Different classes of machines are now on the market adapted to di conditions. These may be roughly considered as follows:

"Cart Machine." This is the two-wheel machine operated b man and two mules. It usually treats three or four rows at a tim will take care of about 100 acres of cotton for the season. It deri power from the wheels. Now selling for from $250 to $350.

e-Mule Machine." This is an intermediate machine, which is ed by one man and one mule. It runs between the rows like a g cultivator and treats two or three rows at a time. This machine selling for about $100 and will take care of from 50 to 60 acres on through the season. It is especially adapted for stumpy land small properties, though also suitable for use on larger areas.

ldle Gun." This is a new type of gun which is now just being ped, but the idea is to produce a gun which can be carried on ack and operated by the rider. This gun will be arranged to wo rows at a time. It has not yet been developed to the point of g acreage capacity and the only model now on the market sells for y over $50.

nd Gun." This is the one-row, hand-operated gun carried by a and is now selling for from $12 to $20. It will take care of from acres for the season. On account of labor difficulties involved, ldom practicable to use hand guns on more than 25 acres in one zation.

HOW TO POISON

(Quoted from U. S. Department Agriculture, Circular 162 by Coad and Cassidy.)

only pure calcium arsenate in the form of a dry powder.
ly this only in the dust form.
chase this to conform to the following specifications:

t less than 40 per cent total arsenic pentoxid.
t more than 0.75 per cent water-soluble arsenic pentoxid.
nsity not less than 80 or more than 100 cubic inches per pound.

e your county agent send a sample of your calcium arsenate to elta Laboratory, Tallulah, La., for free analysis to make sure is satisfactory.

only dusting machinery especially constructed for cotton dusting.
son only when the air is calm and the plants are moist. This cally means making only night applications.

about 5 to 7 pounds of calcium arsenate per acre for each ation.

t poisoning when the weevils have punctured from 10 to 15 per f the squares.

p your cotton thoroughly dusted until the weevils are under control. usually means about three applications at the rate of one every ays.

n stop poisoning until the weevils again become abundant.
he weevils become abundant early enough to injure your young make one or two more applications late in the season.
ou have a heavy rain within 24 hours after dusting, repeat this ation immediately.

Do not expect to eradicate the weevils. Poisoning merely co them sufficiently to permit a full crop of cotton, and you can alway weevils in the successfully poisoned field.

Keep your cotton acreage low and do everything possible to in your yield per acre, as it costs just as much to poison one-quarter ba acre cotton as bale per acre cotton.

Always leave an occasional portion of a field unpoisoned for cor son with the adjoining poisoned part. This will show how muc have increased your yield by poisoning.

If you are considering poisoning, write the Delta Laborato Tallulah, La., for more detailed information; also ask the advice o county agent.

DO IT RIGHT OR NOT AT ALL

One-Mule Dusting Machine in Operation

Especially adapted for rough or stumpy land; also for farmers whose acreage will not justify buying the larger machines. Sells for $100 to $125, and will cover fifteen to twenty acres in a night's work. One of these machines can be allotted to from fifty to sixty acres of cotton for the season.—*(U. S. Dept. Agr.)*

TURAL PRACTICES FOR GROWING COTTON UNDER BOLL WEEVIL CONDITIONS

C. B. Williams

SOILS

nt cotton preferably on upland soils. One will run a risk to plant ttom lands or lands near wooded areas. Well drained sandy loam should be given preference. They are warmer and growth starts r in the spring. Use the most fertile soils, as lands that are in a state of cultivation will not make good yields of cotton even under est conditions.

PREPARATION

e land should be thoroughly prepared by either fall or early spring ing and the seed beds should be made early in the spring so that will have time to settle before planting. Cotton germinates quicker growth starts quicker from a firm, well settled bed than from a one.

CULTIVATION

ltivation should be frequent and thorough after the crop is up. will destroy weeds and grasses, maintain a dust mulch and tend to nt excessive loss of moisture, thus insuring a quicker growth of lants at all times. The cultivation should also be shallow and care d be taken not to cut the roots of the plants.

VARIETIES

e heaviest boll-weevil damage usually begins about thirty days after rst cotton blooms appear. For this reason the varieties of cotton set and hold the largest amount of fruit within the first thirty of blooming, yield the most lint under boll-weevil conditions. The hort staple varieties for this purpose are Cleveland Big Boll, Mexi- Big Boll, and Edgecombe Cook. The best long staple varieties are r -49-4, Express, Lone Star and Delta Type.

e early small boll varieties such as King, Simpkins, Ricks, Sugar Get-There-First and Beat-the-Boll-Weevil are not as productive e above named short staple varieties.

RATE OF PLANTING AND SPACING

nt only good sound seed and plant them thick, a bushel to a bushel half to the acre. Every care must be used to get a good stand at rst planting, for replanted cotton has very little chance to set fruit the boll weevil is present. Leave the stalks thick in the row, six or inches between hills, with two or three stalks to the hill. This asten maturity, and cause as good or a better yield than wider g and fewer stalks.

FERTILIZATION

Kinds of Fertilizer to Use

For the Coastal Plain soils use a fertilizer analyzing about 8 per cent phosphoric acid, 4 to 5 per cent ammonia, and 3 to 4 per potash. For Piedmont soils use a fertilizer analyzing about 12 cent phosphoric acid, 3 per cent ammonia and 2 per cent potash. ample supply of organic matter is necessary both for its value fertilizer and the absorption of heat. Stable manure is fine for purpose, also the turning under of green cover crops such as r clover.

Amount of Fertilizer to Apply

On lands that are not in a very high state of cultivation the u from 600 to 900 pounds of fertilizer per acre is recommended. experimental results have shown on an average for a number of that the use of 900 to 1,000 pounds of fertilizer under cotton was profitable than the use of smaller applications.

Time to Apply the Fertilizer

Before the boll weevil came it was a good farming practice to use of the fertilizer before planting and part at a later date. This pr tended to make the plant fruit over a longer period of time. We strongly recommend that all of the fertilizer be either applied b planting, or, if the application is divided, to make the second applic at the first chopping. By this method the plants will keep gr vigorously and early fruiting and maturity will be hastened.

Preferred Sources of Fertilizing Materials

The use of a large percentage of soluble or quick acting materi imperative. For the ammonia at least two-thirds should come nitrate of soda, sulphate of ammonia or other good inorganic so and it will be just as well or better for all of the ammonia to come these sources. They are not only quicker in action, thereby hast growth, but are often cheaper. Acid phosphate should be used source of phosphoric acid; and muriate of potash, sulphate of pota kainit as the source of potash.

FOOD AND FEED CROPS

In addition to following the best methods for growing cotton weevil conditions, which means a reduced acreage; food and feed in abundance for the farm and family and to supply the cities s be grown, as well as such other money crops as can be handled vantage. Among these are tobacco, peanuts, soybeans, velvet cowpeas, corn, wheat, oats, sorghum and rye.

ORTICULTURAL SUGGESTIONS FOR BOLL WEEVIL COUNTIES

C. D. Matthews

COMMERCIAL OPERATIONS WITH TRUCK, FRUIT, ETC.

e present boll-weevil counties and the future boll-weevil counties both natural and economic advantages for growing other money and for developing agricultural industries of a horticultural nature. of these counties have splendid possibilities for the production of potatoes, and strawberries to a less extent. Certain sections in counties have advantages for the production of Irish potatoes, nes, cantaloupes, watermelons, and some minor truck crops. Space not permit discussion of the possibilities of these different crops, suffice it to say that all of them should receive consideration as ey crops in boll-weevil sections.

xperience in boll-weevil states makes it advisable to caution growers ust rushing in blindly to grow new crops on a large scale without acquainting themselves with the business of producing and market- their crops. If these precautionary steps are not taken, disappoint- t or certain failure are very likely to follow. The crops to be grown ld be decided upon only after careful consideration. Then full vledge regarding the production, handling, and marketing of those s should be secured. The successful production and marketing of horticultural products is a specialized business and requires special- knowledge, so it is essential that growers do some careful thinking re embarking too extensively in new fields. Individual growers ld plant only a limited acreage until they have learned the business rowing the particular vegetables and fruits that they may have cted.

eet the problem of growing different crops not as an individual, but coöperating in groups. If it is necessary to grow new crops in a munity, the success of each grower will depend largely upon the elopment of the community in these new endeavors. Organize the munity so that frequent meetings can be held to discuss the advisa- y of producing certain crops, the acreage to grow, and the production hods. Better crops can be grown at a lower net cost by growers king in groups with an accepted plan, than can be produced by ated individuals working alone. A sufficient volume of uniform le will thus be produced in a community to warrant consideration the markets and the marketing problem will be greatly simplified. igh yield per acre and low net cost are important factors from a duction standpoint, in making a financial success in truck and fruit wing. Community production plans will materially aid in bringing ut this condition. Each individual and each community group uld study their particular horticultural crops and work out plans t produce a high yield at a low net cost.

THE FARM GARDEN

No plan for meeting boll-weevil conditions or for developing diversified agriculture is complete without a consideration of the fa garden. The farm garden in the South has not received the attent from southern farmers that its importance warrants. It has been s that the farm garden is the most neglected phase of southern agricultu

Not only is it possible to reduce the cost of the family's food sup by having a really good farm garden, but the convenience and benefit having a supply of fresh vegetables always available cannot be measu in dollars and cents. It means better living for the farm family. many localities the only means of securing fresh vegetables is fr gardens of the community. For the family's sake, have a *good* gard

The economic importance of the farm garden was never greater tl at present. High freight rates are causing fresh vegetables to sell bey the reach of many and are often making it unprofitable to ship th away from the place of production. The farmer who buys vegetable not only paying the cost of production, but is also paying the cost transportation and marketing.

Recent discoveries in the field of human nutrition have shown importance and absolute necessity of fresh leafy vegetables in the and have caused a general realization of the value of fresh vegetable food. Fresh vegetables in too many cases make up a very small part the North Carolina farm diet.

The home garden should be conducted with the aim to supply family table with an abundance and variety of fresh vegetables dur a greater part of the year. From careful observation, it can safely said that a well-kept garden will yield a return five to ten times gre than would the same plot devoted to general farm crops. An incre in the number and quality of farm gardens should be one of the f considerations of every community in meeting boll-weevil conditions.

IMAL INDUSTRY SUGGESTIONS FOR BOLL WEEVIL CONDITIONS

B. F. Kaupp, J. A. Arey, W. W. Shay

HENS AND HARD TIMES

r the past forty years whenever there was a financial stringency he bottom had dropped out of all farm crops, the poultry products never failed to be higher in price than any other live stock product, :his when all feeds were at the lowest. In some sections of this today a dozen eggs will buy one and one-half bushels of corn, and grains and feeds in proportion.

hen kept in the haphazard way does just as the old jungle fowl did; is, she lays just enough eggs in the spring to hatch and raise a brood ;o of chicks. Any old hen will lay in the spring, and the average hen lays about 76 eggs per year, laying most of these in the spring. :his same hen handled and cared for properly will lay several times number. Every one who keeps poultry can run the hen's egg- iine at a profit. The hen will not do it of her own free will to the city of present-day demands. Allowed to roam at will without er care, she returns to her habits of the jungle days and egg pro- ion is confined to the natural breeding season. We must learn to ly egg-making material in conjunction with "bodily maintenance " proper housing and environments. Poultry keepers have learned h by watching a hen on free range balancing her own ration, and by :ing that she laid freely in the spring when green stuff, worms and :ts were plentiful. Then as fall comes on she had to go through a lt under adverse circumstances as her green feeds, worms, and insects gone and biddy stopped laying. In fact, she stopped laying for the er when the moulting came on. Thus we learned that in the agement of laying hens to produce the greatest possible egg yield, it necessary to supply her with all the material she picked up herself ie spring and summer, if we were to get eggs when wanted.

his material was all soft feed—green stuff, such as grass and every of vegetable; in fact, almost anything green the hen would seem to h—the bugs and worms were the animal food. This soft food was umed *every day* and *all day*. The hen never grew too fat on it. It apidly turned into eggs, because it was soft and easily assimilated. more she consumed the better she laid, and she had to consume great ntities to lay an egg every day or five eggs a week, because it was the food that would make eggs.

Ve learned further that this soft feed was to make eggs only, and to supply the necessary material for the hen's "up keep." The soft would not "stay" with the hen and unless she had received a full ing of hard grain in variety at night, an hour before roosting time, would be hungry a few hours after going to roost, and a hungry does not lay.

Management of Poultry

Fifty to one hundred hens is the proper unit for a well regulated f and these a standard breed of one variety only.

A practical farm poultry house is needed, properly built, so that dry and absolutely free from any draughts; located in such a place the water drains in all directions from it; shed roof type, with four open wire front and facing the South.

Give careful and proper sanitation, as lice and poultry do no together well. Raise a succession of pasture crops that the hens have plenty of green food *every day* and *all day*.

Supply plenty of fresh water at all times and keep this in a sani container, as a laying hen consumes about ten gallons of water year.

Have an every-day supply of charcoal, grit and oyster shell, she may have easy access to and not have to burn up food useless trying to hunt a sufficient amount.

Have good brood coops with removable floors for the care of early chicks.

Hatch all large dual purpose breeds in February and March, Leghorns in March and April.

Keep a sufficient number of the early pullets to supplement one-half to two-thirds of the old hens.

Feed all chicks properly with the kind of food that will grow the maturity in the shortest possible time.

Cull the old hens as soon as they start moulting in July, August September, and retain only the heavy producers.

Feed hens for egg production. The following mashes and grain have proven good, plus the above mentioned conditions. Don't f that meat meal, blood meal, tankage and milk are the egg making f

Mashes	Scratch
1 pound Bran	1 pound Cracked Corn
1 pound Middlings	1 pound Wheat
1 pound Corn Meal	1 pound Oats
1 pound Ground Oats	

Many other combinations can be made that are equally as goo better. They will always be low in fat and high in protein and latter ingredient is always furnished by milk and animal foods.

THE MILK COW A SAFE INVESTMENT FOR THE COTTON FAR

Readjustment of farm practices will be made necessary on m farms in the cotton growing area of the State as the boll weevil incr in numbers, causing the returns from cotton to be not only gr diminished, but very uncertain. To the farmers of this section dairy cow offers a safe and dependable income. She will not make

h overnight, but when properly fed and cared for, the income from her is as safe as anything can be made in the farming

od average grade cow, which can be purchased for about $75 to ill produce annually 600 gallons of milk, containing 232 pounds If the milk were sold at 30 cents per gallon, the income from lone would be $180. However, the demand for market milk is , and the majority of the farmers will have to dispose of their n the form of cream to a nearby creamery. The price of fat according to the price being paid for butter, but taking 48 cents d as a basis, the annual returns from fat produced by this cow be $111.36. Adding to this the value of 4,300 pounds of skim t 40 cents per hundred, $5 for the calf, and $30 for the manure, ve a total income of $163.56 per year. Subtracting from this t $110 for cost of feed, we have a profit over feed cost of $53.56 s *one cow.*

ently the president of a Federal Land Bank, located in the Central gave out the following statement: "We find that where the farmers ce crop rotation and livestock growing, particularly dairying with ber of good milk cows on the farm, they are successful."

of the greatest problems confronting the farmer is the conserva- f soil fertility. There is some difference of opinion as to the best ds of accomplishing this, but judging the future by the past, we fely say there is no method that is more certain of results than the g of livestock. The dairy farmer, being a consumer rather than a of feeds, is constantly building up the fertility of his soil. Per- nt pastures which are essential in successful dairy farming also soil conservation and prevent soil erosion.

a basis of 20 cents a pound for nitrogen and 6 cents each for phos- acid and potash, red clover hay has a fertilizing value per ton of 3, cowpea hay $10.19, bran $16.08, corn $8.60, and cotton-seed meal 2. These materials can be fed to a cow and converted into cream ining 30 per cent fat which has a fertilizing value of only about r ton, while its present market value is $300. It will be noted the above that although cream has a high market value its fertiliz- alue is very low as compared to that of the feeds from which it is ceed. In other words the fertilizing value of the feed stays on the

This is a matter that should receive serious consideration by n Carolina farmers who collectively find it necessary to spend ons of dollars annually for commercial fertilizers.

ccessful dairying requires closer attention and a more thorough ledge of the details of the business than cotton growing. Pastures be made, feeds grown, and a market located before it is safe to t in cows for the purpose of producing butter-fat commercially, but these things provided the dairy cow offers a safe investment for farmer who is willing to properly care for her.

PROFIT IN PORK PRODUCTION

The natural advantages of most of the cotton growing area of State as a pork producing section are not fully realized. These vantages have been persistently prostituted rather than utilized.

The peanut and soybean, both admittedly cheap feeds, produce pork, which is also cheap.

A study of the following quotations on hogs by six markets under of December 3, all eastern and southern except Chicago, three of w are based on soft, and three on hard hogs, shows an average differ in price on the eastern markets of $2.75 per hundred pounds, du quality; this, in the case of a 200-pound hog, amounts to $5.50.

Quotations—December 3, 1921

Soft Pork Basis

Jacksonville, Fla.	165 lbs.—225 lbs.	
Montgomery, Ala.	165 lbs. Up	
Atlanta, Ga.	165 lbs.—200 lbs.	

Hard Pork Basis

Richmond, Va.	140 lbs.—200 lbs.	$8.00-$
Baltimore, Md.	165 lbs.—200 lbs.	
Chicago, Ill.	Medium, Practical, Top	

It will be noticed that there is a difference of $1.25 per hun between the eastern and Chicago markets. This is due to the fact 98 per cent of Chicago bought hogs travel east.

It is safe to say that between 70 and 75 per cent of soybean peanut-fed hogs are sold during November, December, January February, the four months of lowest average prices of the year.

The seasonal difference in the price of medium hogs Chicago ma ten year average between January and April, is $1.75 per 100 lbs 200-pound hog $3.50. Between September and December, $1.25 100 pounds; a 200-pound hog $2.50. The difference this year (19 was $5.00 seasonal, and $2.25 quality variant; in the case of a pound hog, $14.50.

In the case of a carload of 70 head of 200-pound hogs, sold August hard at $13, or November 21 soft, we have the following:

August 1, 14,000 lbs. hard hog, at $13	$1
November 21, 14,000 lbs. soft hogs, at $5.75	
Loss: Due to season $700; due to quality, $315	$1

Is it any wonder that the hog cannot live up to his reputation "mortgage-lifter" under such conditions?

We produced hogs last year (1921) in North Carolina at a feed co less than $6 per hundred, and they never saw a peanut or soybean.

roduce a good quality of pork in North Carolina at a substantial
and beat the corn belt hog to the high market the same as we beat
uit and vegetable growers to the early market.
February farrowed pigs at 200 pounds in early August. Let
farrowed pigs glean the peanut and soybean fields, thus putting
cheap 100 pounds by January 1; add another 100 pounds with
nd fish meal, and market them in the middle of March.
vould, perhaps, be too much to say that the importance of grazing
has been over-emphasized, but it is certain that too much de-
nce has been put upon it.
e dairy cow can pay for her feed with milk and butter; the horse
ıle by labor, and the hen with eggs; but the hog can only pay
gh increase in weight, and we have seen by a comparison of the
quoted prices that quality and the time of year it is marketed
a sufficient combined influence on the price of pork to make the
ence between a substantial profit and loss.
e price of land, the cost of labor, climate, and the price differential
rd hogs between the Chicago and Eastern markets are all in favor
Southern pork producer.
ies within the power of the farmers of the cotton belt to move the
elt South—and the operation will be a profitable one—but he must
earn to supply what the market wants when the price is best. The
te of this State enables him to do this, and therein lies his
ıtage.